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RESEARCH CONFERENCE ON LEARNING AND THE EDUCATIONAL PROCESS AT STANFORD UNIVERSITY, JUNE 22-JULY 31, 1964.

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FROM AMONG APPROXIMATELY 175 APPLICANTS, 40 PERSONS WERE SELECTED TO PARTICIPATE IN A CONFERENCE TO DISCUSS CURRENT RESEARCH IN EDUCATIONAL LEARNING, INCLUDING BOTH CLASSROOM AND LABORATORY STUDIES. THE CONFERENCE WAS ORGANIZED INTO FOUR GROUPS--(1) IN GROUP A, THE EMPHASIS WAS ON LEARNING, INSTRUCTION, AND PUPIL CHARACTERISTICS, WITH PARTICULAR REFERENCE TO THE LANGUAGE ARTS, (2) IN GROUP B, THE BEHAVIORAL ANALYSIS OF CONCEPT FORMATION AND TRANSFER WITH IMPLICATIONS FOR PROGRAMED INSTRUCTION AND COMPUTERS IN EDUCATIONAL RESEARCH WERE STRESSED, (3) IN GROUP C, THE FOCUS WAS ON SOCIOCULTURAL AND ORGANIZATIONAL DETERMINANTS OF STUDENT MOTIVATION, (4) IN GROUP D, THE MOTIVATIONAL DETERMINANTS OF ACHIEVEMENT-ORIENTED BEHAVIOR WERE HIGHLIGHTED. PARTICIPANTS WERE SPECIALISTS IN EDUCATIONAL PSYCHOLOGY, PSYCHOLOGY, OR SOCIOLOGY, PLUS A FEW FROM OTHER FIELDS. THE REPORT PRESENTS THE SELECTION OF PARTICIPANT PROCEDURES, PRECONFERENCE AND CONFERENCE ACTIVITIES, A LOG OF CONFERENCE ACTIVITIES, AND A LIST OF PARTICIPANTS. (JC)

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RESEARCH CONFERENCE ON LEARNING AND THE EDUCATIONAL PROCESS

at Stanford University, June 22-July 31, 1964

Cooperative Research Project No. F-019

Conference directors: Lee J. Cronbach and Richard C. Atkinson, representing the Committee on Learning and the Educational Process of the Social Science Research Council

Stanford University

Stanford, California

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This report is designed to serve several purposes. It is the formal record of activities required under the contract with the U.S. Office, a permanent record for the Social Science Research Council and other interested agencies, a guide to the planning of future conferences, and a statement to help prospective applicants for our 1965 conference to judge what values such a conference might have for them.

To aid in preparing the report we had the records of the conference, the reports by instructors interviewed at the end of the conference, and written statements from nearly all participants. The participants wrote letters responding to a loosely structured set of questions; numerical tabulations of their responses are inappropriate since different persons chose different aspects of the conference for discussion. Where we speak of a consensus among participants, it should be recognized that we are drawing this inference from the group who did speak on this matter, and that on virtually every matter one could find some minority sentiment. We can, at best, give a general impression of the success of our various procedures and activities.

This report is organized chronologically. In connection with each matter considered, we shall comment on possible alterations of plan for the 1965 conference now being arranged; none of these changes is yet final, and no doubt the plans will be evolving, as were those in 1964, up to the final day of the conference.

Initiation of the conference. The conference was suggested by the SSRC Committee (whose members are E. J. Gibson, Evan Kieslar, and Judson Shaplin, in addition to the conference directors); the idea was accepted as a worthwhile "developmental activity" under the Cooperative Research Program of the U.S. Office of Education. The contract was made with the Institute for Mathematical Studies in the Social Sciences at Stanford University. Since the U.S. Office was administratively unable to provide stipends for participants, some additional funds were obtained from the Carnegie Corporation of New York for the benefit of participants who would otherwise not have had income during the conference period. These funds covered most but not all of the participants in that category. All participants received living expenses ($16 per day except for persons commuting from their homes).

Announcements. A news announcement regarding the conference was placed in the houseorgans of the American Sociological Association, the American Educational Research Association, and the American Psychological Association (and its Division 15). A brochure was printed and mailed to departments of education and psychology. As this brochure carried application information, it was mailed also to persons who requested information as a result of the news announcements. Instructors, Committee members, and Julius Sessenrath who served as a research associate during this planning period drew the conference to the attention of suitable participants. This was highly effective; many of the most suitable participants were brought in through personal contact.

The news announcements were often not published until the December issues of the various publications, and the brochures were not mailed until late November. With a January 10 application deadline -- necessary to allow announcement at a reasonably early date so that participants could make summer plans -- many interested persons were unable to apply. The late date was made necessary both by delays in obtaining contract approval and by the necessity of working out plans with the instructors. It is strongly recommended that future conference contracts be completely approved a full twelve months before the conference is to start; that is a minimum lead time for selecting instructors and planning announcements in an adequate manner.

It seems likely that in 1965 and subsequent years there may be more than one conference of this general nature. It would be highly desirable to coordinate announcements so that prospective applicants would know of all such opportunities simultaneously.

Conference staff. It was planned to organize participants into four groups, each led by a senior research worker. This instructor, chosen by the SSRC committee, selected a second, younger instructor to assist him. The teams so formed were:

Group A: J. B. Carroll, Harvard University; E. B. Page, Univ. of Connecticut
Group B: L. M. Stolurow and R. C. Anderson, Univ. of Illinois
Group C: F. L. Strodtbeck, Univ. of Chicago; L. M. Smith, Washington Univ. (St. Louis)
Group D: J. W. Atkinson, Univ. of Michigan; Robert Moulton, Univ. of California (Berkeley)

The Committee and the participants were greatly pleased with the instructional staff; their competence, enthusiasm, imagination, and all-but-inexhaustible energy is what made the conference a success.

The senior-and-junior-instructor format was borrowed from earlier conferences on mathematical research in the social sciences, where a senior researcher used a much younger person, perhaps a graduate student, as an assistant. This provided for the fact that, in such highly technical material, the instructor's presentation of his own research might require further explication by someone already familiar with it. In our conference, the "junior" instructors were independent investigators in their own right. Their role worked out differently in each group. In the light of our experience, we propose to abandon the team format in 1965. While we shall use both more and less senior instructors, we shall not subordinate one to the other. Team teaching, if any, will develop out of common interests and be continued just so long as it serves a clear function. To put it another way: instructors who came in as "juniors" made their greatest contribution when they served as independent instructors and consultants rather than when they tried to amplify the ideas of the group leader; our requirements are not like those of the mathematical conferences.

We may anticipate later comments to say that the strict group structure followed in 1964 is to be relaxed in 1965. While the groups functioned very well, the barriers between groups were too high. Participants tended not to form acquaintances with persons in other groups and were less able to take advantage of activities scheduled by other groups than would have been desirable.

The preconference arrangements were made by Madlyn Lees, Edith Jones, and Thelma Weeks of the Institute for Mathematical Studies in the Social Sciences; Mrs. Lees has handled all financial matters for the conference. The conference secretary was Clara Hahne, assisted by Miriam Betensky and Virginia Baker; Vern Bengston was assistant in Group C. The participants and instructors had high praise for the service and arrangements this staff provided, praise which the directors are happy to echo. All the staff members displayed the utmost devotion to the conference and to the interests of the individual participants.

Selection of participants. Participants were selected by the group leaders and Conference directors on the basis of their indicated experience and the quality of their work, particularly as this could be judged from supporting letters. There were 175 applications from all regions of the country. There were two applicants from overseas; one of these was selected. Of the 175 applications, approximately 40 were from persons whose degrees had not yet been completed. To provide for a proper balance of experience, predoctoral applicants were judged separately from applicants with greater experience. In the end, 10 predoctoral candidates were accepted. About 10 participants were relatively senior persons with Ph.D.'s received prior to 1955; most of these have a substantial record of published research. In selecting participants the Committee considered not only quality but also the balance of experience going into each group, and the fit between the individual's interests and the program of the group. This led to a slight inequality of distribution, with groups ranging from 7 to 12 members.

The instructors identified at least 90 applicants as suitable participants. That is to say, the number of acceptable applicants was more than twice the number of positions available. Considering that many interested persons did not apply because the announcement reached them rather late, that some interested persons had other plans in 1964, and that a slight shift in topical interest would no doubt attract a different group of excellent applicants, it appears that there will be no difficulty in attracting a group of applicants in 1965 comparable to the 1964 group.

We propose a few modifications of selection procedure for 1965. For the persons with Ph.D's 1963 and earlier, selection can be made with quite satisfactory validity from a brief vita, description of research interests and publications, and supporting letters. Applicants should obtain letters from persons who can speak about their research performance and promise; letters from deans and other administrative superiors seem to be less informative for our purposes than letters from

the person's colleagues in research and his former teachers. There were quite a few applications from persons chiefly interested in learning current ideas in the field, to improve their own work as teachers or educational administrators. While there is a need for conferences to serve these persons, our conference is limited to persons engaged in research or entering upon research careers. We did not plan for applications from outside the United States in the 1964 conference and had made no provision for overseas travel. The 1965 plans include a provision for a small number of participants from overseas.

With regard to predoctoral applicants and those with very recent degrees, the information obtained in 1964 was insufficient. Faculties hold very high hopes for their students; every supporting letter of a predoctoral applicant was couched in such superlatives that comparisons were next to impossible. We believe that the applicants were indeed of high quality and may well have been the very best products of their institutions. Since we must compare across institutions, the application procedure for inexperienced persons must be amplified to demand a transcript of courses and grades, a description of research completed or in progress, or both.

The participants selected in 1964 were a remarkable group. Their interests ranged widely, and some had had extensive experience while a few were planning their first major studies. Even among the persons who were just finishing dissertations, there were a few who had been given major responsibility for research planning and data analysis in curriculum projects supported by national agencies. There were participants with primary interest in educational psychology, experimental psychology, social psychology, and sociology; plus a scattered few from such areas as educational administration and clinical psychology. The participants' experiences made a valuable addition to the instructional resources of the conference.

Preconference activities. Notifications of acceptance were sent to participants about February 1. Since the majority of the group and most of the instructors were expected to attend the convention of the American Educational Research Association in mid-February, an evening reception was scheduled to permit those present to meet their fellow conferees. There was some opportunity for the several groups to meet as groups and to discuss mutual interests and plans.

The instructors communicated with participants to some extent during the Spring, outlining the interests of the group and suggesting readings. They also selected and invited various outstanding researchers to serve as consultants to their groups. The selection of consultants spread over a long period; some were invited as early as December 1 and some as late as June 15. Experience now suggests that the consultants should be selected shortly after participants are chosen, preferably by March 1. Information to participants about the prospective consultants, reading lists suggested by consultants and instructors, and similar background for home work should be in the participants' hands not later than April 1.

Lists sent later than that date cannot be used effectively, due to the usual end-of-year rush. It is also suggested that participants be encouraged to distribute copies of their own work such as proposals they are developing, reprints of recent research, and the like. In the present conference, a participant had some difficulty knowing which others would be interested in his particular problems.

Housing for participants was provided in Stanford dormitories and student apartments. Many participants arranged to sublease houses and apartments in the community. Some dissatisfaction regarding housing arrangements was expressed and other possibilities for 1965 should be explored. The wide scatter of living places meant that conference activity usually ended at 6 p.m.; the participants would have liked more opportunity for out-of-hours discussion. Possibly a fraternity house could be rented which would provide living space for participants with and without families. Dormitory rooms were inexpensive and satisfactory, but dormitory residents reported that they regretted having purchased meal tickets. Even though this saved money, it meant missing a number of informal lunch-hour conversations that others reported to be of great value. The rigid schedule for dormitory meals also made it necessary to leave some discussions before they had concluded. There was marked dissatisfaction with the apartments for married students which some persons rented or subleased from the regular tenants. Stanford is on a quarter system and it was necessary to pay rent for the month of August; moreover, in some cases there was a substantial additional charge for use of the regular tenant's appliances. Probably the most satisfactory arrangement, in 1964, was that in which two or more participants shared an apartment or house. This provided housing at modest cost and allowed for out-of-hours interaction. It may be mentioned that participants living off campus found it necessary to rent automobiles; this can be done at moderate monthly rates. Living in the Stanford area is expensive, but participants seemed to feel that the attractions of the area offset this.

Holding the conference at Stanford provides a fine opportunity for a family vacation, but some participants suggest that this is not desirable. The conference in 1964 was an experience that participants wanted to experience fully, and many of them felt they were losing values of the conference when they reserved evenings and weekends for family activities. This, obviously, is a matter for decision by the individual participant. The families that came seemed to have a fine time.

Conference procedures. There were programs within individual groups and other programs planned for the conference as a whole. Within groups, there was a concentration on a particular, though broadly defined theme. The topical emphases were roughly as follows:

A (Carroll-Page). Learning as a function of aptitudes and instructional variables; transfer of learning; special problems in language learning. Psychological bases of curriculum innovations; evaluation.

B (Stolurow-Anderson). Analysis of educational materials and situations for experimental purposes. Technology of instruction including computer-based instruction. Research on thought processes and instructional sets.

C (Stodtbeck-Smith). The school as a social organization; effects of class structure, the peer group on motivation. Sources of motivation in the home and community; the culturally deprived. Methodology for studying cultural and organizational variables.

D (Atkinson-Moulton). Theory of motivation. Motivation to achieve and motivation to avoid failure. Effects on choice of tasks and response to instruction. Methodology for studying personality variables.

Each group leader selected consultants whose research was pertinent to the theme of his group; the consultant typically spent two days at the conference, most of it with that group. With few exceptions, each consultant gave a general talk on his research that was open to the entire conference, or a lecture open to the Stanford campus as well as the conference. These talks and lectures were scheduled in the afternoon of the first day of the visit. This proved to be a tactical error; the general talk should precede the discussion sessions. Participants were urged to solicit individual conferences with consultants who might help them with their own research problems.

In addition to consultants brought in to serve particular groups, a number of talks were scheduled by persons who could report on matters of general interest. Thus James Savage talked on Bayesian statistics, and Lawrence Cremin and Ralph Tyler talked on forces leading to curriculum change during the past two generations. The Conference took advantage of the presence on the campus of a curriculum writing group in the field of elementary science, working under AAAS auspices; some participants made arrangements for visits to this group following a general talk to the conference. For another conference Herbert Greenberg of IBM had installed a terminal for the COURSEWRITER instructional system which was operative daily through a cross-country line tying it to a computer in Yorktown. A small group of participants in Group B made work with this system a major feature of their research planning, and tried various pilot operations on it. A complete list of consultants, talks, and other scheduled activities is presented in an appendix. The schedule does not show the numerous informal meetings arranged by participants.

It was the assumption in setting forth this smorgasbord of activities that participants were sufficiently mature to sample wisely. It was stated at the outset that participants were free to attend or not to attend talks, and that it was acceptable behavior to drop in on a talk or discussion briefly before returning to more individual pursuits.

To foster maximum cohesion and continuity of discussion, participants were urged to spend each morning with their groups. Transfers from group to group were not allowed, and "visiting" morning sessions to take advantage of particular consultants was discouraged. Some group leaders developed programs that tended to hold their groups together -- and isolated from other groups -- in the afternoons as well. In retrospect, too great an emphasis was placed on group cohesion. Conducting the program in distinct groups provides an indispensible continuity in the institutes on mathematical psychology whose experience we drew upon; in that area there is such continuity of argument involving technical detail, notation, etc. that the occasional visitor wastes his time. The discussions in our conference were not so sequential. Strong group cohesion was needed to facilitate candid discussion of the participants' research plans, and continuity was needed for the development of certain ideas. But for 1965 a reorganization will be sought that will greatly increase the opportunity for participants to form acquaintances across the whole conference, and to reform the group structure as the conference proceeds. One possibility is to organize two-week seminars with particular foci, regrouping around new foci at the end of that period.

The first week of the conference is best used for making acquaintances and exploring interests of the group. The last week is best used for various forms of closure, including integrative discussions and conferences on individual research plans. Consultants are less useful in those two weeks than in the middle period. There is virtual unanimity that six weeks is the right duration for a conference that emphasizes assistance to the individual with his own research. While some participants felt that they had not reached anything like a saturation point, in the sixth week of the 1964 conference the weight of fatigue was beginning to suppress enthusiasm.

There was a thought, in early plans for the conference, that the ideal end-of-conference outcome would be a completed, ready-to-submit research proposal for each participant. This "goal" was unrealistic, and it was a mistake to have mentioned it to staff and participants because it haunted the conference scene as a source of anxiety. Many plans were moved forward and will eventually lead to submissions, but there will be only a trickle of conference-shaped proposals in the next few months. The conference served to pull many participants up from their familiar ruts and give them a view of new territory into which they can extend a path. Several groups of two or three participants discovered or developed common interests that will evolve into joint or parallel investigations; but such teams tended to take form only late in the conference. Only in the last week or so did the typical participant begin to be able to choose among the alternative lines of research suggested by the conference. Any proposal that jelled before this extension of interests had matured would have been inferior to those the participant can now develop.

The conference was visited by representatives of three government agencies (NSF, NIMH, and USOE), each of whom discussed the mission of his agency and candidly answered questions on policies, reviewing standards, and procedures. There were also sessions in which some of the leaders drew on their experience as referees for journals and proposal reviewers to give an inside account of common faults and introduce some of the legitimate arts of grantsmanship. These sessions were much appreciated. The things said, while common knowledge in certain circles, are rarely known to the young investigator or to the one in an outlying institution. Our participants felt reassured as to their own chances for success and as to the reasonableness of reviewing standards. Meeting government representatives personally was itself an encouraging experience. The time devoted to general aspects of research support should not be increased, however.

There were two broad objectives of the conference: to extend the interests of participants by introducing them to a wide range of current issues and research approaches, in both laboratory psychology and classroom investigations; and to help them with the planning of their own research programs. The former objective was extensive, and was to be accomplished through offering diverse though frequently shallow stimulation. The latter objective called for intensive work by the participant individually or in small discussions. The program of the conference provided for both objectives. The parade of consultants and reports by staff members and participants did introduce a wide range of ideas and did stimulate or extend the interests of participants. This program of scheduled attractions grew until there were often several presentations in one day. The objective was also served by the daily meetings of the groups. The progress of the individual's own research depended more on his initiative than on the plans laid out by instructors, though in every group some sessions were devoted to reports and critiques of individual plans. Those individuals who had a clear idea as to their research objectives were able to solicit the advice of instructors and consultants, and to set up informal conversations with other participants having similar interests.

There was tension between these two modes of operation. Those primarily committed to developing their own programs or obtaining ideas they could carry back to the (say) curriculum study on whose staff they serve found it necessary to turn their backs on many of the "attractions" and resisted the setting up of large group meetings. In their evaluation, these persons advocate reducing group meetings to perhaps 6-9 hours per week, whereas the 1964 schedule provided for at least 15 hours -- often more, when consultants were on hand. Although it had been made explicit from the first day that participants were expected to select, and not to court indigestion by attending every program feature, those participants who did absent themselves apparently felt somewhat fearful that their instructors would consider them to be slackers. Hence the more mature and self-directed participants probably made more progress in their own thinking than those with less focus or greater dependency.

On the other hand, the evaluations by instructors suggest that they were somewhat skeptical of the progress made by participants who worked in large measure on their own instead of staying with the group.

It appears that this conflict is inevitable and should remain a feature of the conference. There will be some participants primarily interested in identifying new lines of work or extending outward from their present base, and these are probably helped more by instructor-arranged plans than by demands for independent work. There are others so much engrossed in active interests that the conference serves best by allowing them to discuss those particular interests and research plans with others, spending much of their time in reading, pilot experimentation, or other non-group activity of their own contrivance. There are two extremes to avoid. One is the participant who becomes so dazzled by the consultants and instructors and fellow participants that he attempts to drink in everything; this does lead to confusion and establishes no base for future research. Hence participants should be sought who have some focus of interests and who are clearly aiming to do research rather than merely to "bring their knowledge up to date." The other extreme is the person so committed to a well-defined research problem and design that he is impermeable. The person who is already committed to a limited problem and mode of approach can profit more from engaging consultants for his project than from spending a summer in such a conference. Moreover, his tendency to reject program features that do not serve his narrow purpose makes him less useful as a group member.

Associated with the problem of diversity of stimulation is the range of participants. The heterogeneity of training and interests received about an equal amount of favorable and unfavorable comment. It posed considerable problems for the discussion leader, who was rarely able to span, in a single session, the interests of the novices in an area and those who wished to pursue advanced questions. While everyone valued exposure to the panorama ranging from laboratory studies of attention to practical concerns of the school administrator about class grouping, the exposure was no more than superficial. In those groups that tried to cover diverse theoretical materials, there was again difficulty in making a deep penetration, partly because the schedule allowed so little time for reading, or, rather, so steadily tempted the participant away from reading. (Says one participant, a staff member in one of the better State universities: "There was not much time for reading and preparation.... Something interesting going on almost every afternoon. It seemed rather silly not to take advantage of the opportunity to hear the consultants; it will be years before they show up at my university.")

Considering all the comments, it appears that a future conference could best cover a topical range somewhat smaller than that in 1964. This would permit a small reduction in the number of consultants. There is general agreement that this program approached the point of overstimulation, and that later conferences should regard the richness of

this program as an upper bound. On the other hand, the participants greatly appreciated such out-of-the-main-line talks as those of Savage, Tyler, and Cremin, and there should continue to be special talks not directly fitted to group interests. What is required is a firmer understanding about the legitimacy of absenting oneself from a group meeting, and a corresponding self-discipline by participants. Another way of overcoming superficiality is to retain some consultants for periods of a week or more, so that their views can be explored more deeply. Discussions can also be deepened by a greater demand for reading by participants, to prepare for particular discussions; this will require improved resources of printed material.

The intention of the Committee to interest qualified investigators in educational problems was clearly attained. There are numerous references in the evaluation reports to gains in understanding. The most frequent comment, in the participant evaluations regarding change of interests, has to do with increased awareness of the possibilities of research in the classroom. Much is said about the importance of instructional variables and about the possibilities of rigorous control in educational studies. This trend no doubt reflects the interests of the instructors. The Committee would have been equally happy to see a surge of interest in the opposite direction -- of psychologists hearing about educational issues and designing laboratory studies to unravel them. While there was some growth in this direction -- notably in the enthusiasm aroused by Simon's report of computer simulation of learning and problem solving -- it was not the chief outcome of the discussions.

As a by-product of the Conference, a collection of selected talks and lectures has been assembled into a book by John Krumboltz. This collection will be published late next Spring by Rand-McNally. The contents of the book are indicated by asterisks in Appendix A.

While the instructors were well chosen, and outperformed the highest hopes of the Committee and the participants, a great deal of the value of the conference came from interchanges among participants. Many of the participants had an excellent background and were highly influential. Several of them had responsibility for research and evaluation in major curriculum projects and were in a good position to report theoretical issues and methodological problems encountered. Participants frequently mention as a particularly beneficial outcome of the conference the opportunity to get to know the others who will be leaders in the arising generation. Perhaps the most interesting is the report of three men, coming from the same University, who shared an apartment. In the course of meals, poolside conversations, and sessions going "on into the night" these men discovered each other and their common interests in a way that had not been possible on their home ground; what started as an economical housing scheme became, for them, the most important feature of the conference.

While forming acquaintances was important, another interesting outcome reported was the growth of self-respect. Some of the most excellent of the participants, judged by their accomplishments thus far in their careers, came -- through the conference -- to view themselves as the potential leaders in research that they are. Their selection, their success in influencing other participants, and the acceptance and constructive criticism of their ideas by their fellows and instructors convinced them that they did indeed know what they were about. If persons so carefully selected require this help in self-evaluation, this argues strongly not only for conferences such as this but also for the sorts of meetings Project Literacy is arranging.

While the facilities available at Stanford University were pleasant in many ways, there were serious inadequacies. Some of these can easily be remedied: lack of convenient duplicating and reproduction equipment, lack of convenient audiovisual service. The dormitory used for the meetings provided inadequate meeting rooms for some of the groups. The rooms for use as offices and studies were satisfactory but the furniture was entirely too meagre and uncomfortable. Participants who would gladly have done desk work or held small group meetings found themselves separating to their residences to avoid the sheer discomfort of these rooms. This can be remedied in part by furniture rental, but a better solution would be to find other accommodations. The "library" in the conference building was made up largely of books loaned by the conference staff. It was truly inadequate, but it is difficult to see how this can be remedied at reasonable cost. The Stanford library was available and helpful, but it appears that the collection lacks many of the books and journals participants wanted to consult.

The enthusiasm of the participants, in their post-conference reports, was expressed in gratifying superlatives: "tremendous experience," "best six-week educational experience of my life," "got more research ideas during the conference than during the preceding six years." Some individuals, however, were given relatively little help. This difficulty was the greatest for persons at two extremes: those with a strong commitment to basic laboratory psychology and no more than a passive interest in educational psychology; and those with a strong commitment to educational service with only a minor involvement in research. Disregarding these extremes, it appeared that the conference served both those who regard themselves as "pure" behavioral scientists and those who are doing operational research and solving firing-line problems. Participants did not change their research interests during the conference. Rather, they came to see them in a broader perspective. The persons closest to the applied end speak most often of gains in theoretical and methodological sophistication. Those with more basic concerns were informed regarding the problems of extrapolation to the complex educational situation, and about variables to be added to their thinking.

Insofar as we can generalize, a conference of this nature serves best the person who is two to four years past his degree. He should be far enough along to have experienced some of the realities of independent research and to have cast off the passive receptivity of the graduate student. He should not yet be, in the words of one participant, "swallowed up in his own program of research." There are many exceptions to this characterization. Several of our participants still working on their degrees had already had sufficient responsibility to be outstanding contributors to the conference and they benefited proportionately. There were some participants with ten years or more of research experience who were at a point to integrate their work and choose a research direction; they too were able to use the conference effectively. The flexibility of the conference in accommodating so many interests and degrees of experience derived almost entirely from the willingness of instructors to schedule individual conferences or special group sessions to explore each individual's problems, and the comparable help available from consultants and other participants. The groups varied considerably in the degree to which they stressed individual problems in group discussions. Some groups used the morning meetings to work through a topical outline setting forth the instructor's concepts; some devoted most of their meetings to loosely connected topics arising directly from the participants' research. Both of these approaches worked, the latter perhaps being somewhat more satisfying to the highly experienced participants.

One is tempted to say, in view of the variety of approaches and topics that "worked," that the important thing about such a conference is that it take place -- that almost any topical emphasis or instructional technique would serve. This is not quite true, but it is true that the instructors were valued for being the able and spirited persons they are rather than for the particular knowledge they selected for emphasis. The participant who is now enthusiastic about his instructor's line of work would have come away equally stimulated if he had been assigned to a group with a different but not incompatible theme. The important thing about the conference was a spirit of enthusiasm: enthusiasm for the good work now being done by workers in the field, enthusiasm for the impressive colleagues met at the conference, enthusiasm for one's own ideas that blossomed in this environment. Many participants commented on the degree to which the conference increased their incentive to do research. Many of them are in environments where they receive only minimal encouragement and little critical assistance, which made the six-week immersion in a group of research-oriented peers invaluable.

The Conference was one step in the formation of a community of educational research workers in the younger generation. There is plentiful talent in this group; the conference did something to develop this talent by extending the training of participants. But its most lasting contribution will be in supplying each member with a reference group of equally able, equally alert colleagues with whom he can continue to communicate.

On behalf of the participants and the SSRC Committee we are happy to express thanks to the instructors, consultants, and staff, the sponsors, Stanford University, and such cooperating groups as AAAS and the IBM Corporation.

Appendix A. Log of Conference Activities, 1964

With rare exceptions, each group met Monday-Friday mornings. The afternoon activities listed in this schedule were generally consecutive, though occasionally they were concurrent. Where a letter appears following the name of a visitor, it indicates the group with which he worked most directly.

June 22 Organization meeting in morning

June 23 Dan Lortie (C)

Talk: Robert Gagne, Henry Walbesser. "Activities of the AAAS Elementary Science Project"

June 24 Lortie (C), Pauline Sears (D)

Talk: Pauline Sears. "Observational studies in classrooms"

*Lecture: J. B. Carroll. "School learning over the long haul"

June 25 Walter Loban (A), Sortie (C), Sears (D)

*Talk: Walter Loban. "Learning Proficiency in Schools"

June 26 Loban (A), R. D. Atkinson (B), Lortie (C)

June 29 Harry Silberman (B), Lortie (C)

Talk: Harry Silberman. "Studies with computer-based instruction"

*Lecture: J. W. Atkinson. "Mainsprings of achievement-oriented activity"

June 30 Silberman (A), Ernst Rothkopf (B), Lortie (C), Howard Becker (C)

July 1 Rothkopf (B), Lortie (C), Becker (C)

*Talk: Ernst Rothkopf. "Learning from sentences"

Panel discussion: Practical aspects of arranging access to schools. (Lortie, Becker, Louis Smith, others)

July 2 R. Atkinson (B), Lortie (C)

Talk: Herbert Greenberg. "The IBM Coursewriter system"

*Included in the book which will be edited by John Krumboltz and published by Rand-McNally.

*Lecture: Lawrence Stolurow. "Model the master teacher or master the teaching model"

July 3 N. L. Gage (A), Lortie (C)

Talk: Harry Levin. "Project Literacy"

July 6 Eleanor Gibson (A), Robert Gagne (B)

Talk: Eleanor Gibson. "Studies of perception in reading"

*Lecture: Robert Gagne. "Educational objectives and human performance"

July 7 Talk: James Savage. "Bayesian statistics"

July 8 Herbert Simon (B), Seymour Sarason (D)

Talk: J. B. Carroll. "Uses of factor analysis" .

Lecture: Herbert Simon. "Information processing psychology and the educational process"

July 9 Simon (B), Sarason (D)

Panel discussion: Behavioral science as represented in educational psychology textbooks. Authors present: Henry Lindgren, Fred McDonald, Lou Smith, Bryce Hudgins, Lee J. Cronbach. Critics: members of Group C.

Lecture: Seymour Sarason. "Discontinuities in the educational experience of children"

July 10 Gagne (B)

July 13 E. G. Begle (B)

Talk: James Matheson. "Optimization of learning sequences"

Talk: Ellis Page. "Statistical implications of the Campbell-Stanley outline of experimental designs"

July 14 Daniel Berlyne (D)

Talk: Willavene Wolf. "A study of eye movements and TV viewing"

July 15 Berlyne (D)

Talk: J. B. Carroll. "Elementary aspects of factor analysis"

*Lecture: Daniel Berlyne. "Curiousity and education"

July 16 Thomas Hilton (A), Berlyne (D)

Talk: Thomas Hilton. "The ETS Growth Study"

July 17 Hilton (A)

Talk: R. W. Tyler. "Research implications of current curriculum movements"

July 20 Patrick Suppes (A)(B)

Talk: J. B. Carroll. "Research proposal evaluation"

July 21 N. L. Gage (A), Gerald Lesser (D)

Talk: Gerald Lesser. "Cultural group differences in development of mental abilities"

Talk: F. L. Strodtbeck. "Achievement and achievement motivation: a New Haven followup"

Talk: Robert Hall. "Policies and procedures in NSF grant review"

July 22 Lesser (D)

Talk: L. J. Cronbach. "Aptitude as an outcome of instruction"

Talk: Asher and Benathy.. "Second language learning"

*Lecture: F. L. Strodtbeck. "The hidden curriculum of the middle-class home"

July 23 J. C. Flanagan (A, C)

Talk: J. C. Flanagan. "Opportunities for research using Project Talent data"

Talk: Bert Kersh and L. M. Stolurow. "Simulation problems and the control of learning environments"

July 24 Visit to Stanford Research Institute

July 27 Talk: Philip Sapir. "Policies and procedures in NIMH research support"

July 28 Evan Kieslar (A), L. J. Cronbach (B), Jerome Kagan (D)

Talk: Lee J. Cronbach. "A concept of evaluation suitable for curriculum research"

*Talk: Evan Kieslar. "Sequence of speaking and listening training in beginning French"

Talk: F. A. J. Ianni. "Programs of the U.S. Office of Education for research"

*Lecture: Jerome Kagan. "Developmental studies of conceptual impulsivity"

July 29 Kieslar (A), Robert Glaser (B), Kagan (D)

Talk: E. G. Begle. "The School Mathematics Study Group"

Talk: Lawrence Cremin. "Educational objectives: an historical view"

July 30 Glaser (B)

Talk: Robert Glaser. "Elements of the psychology of learning that are important for the technology of education"

July 31

Appendix B. Participants Attending the Research Conference on Learning and the Educational Process

Richard C. Atkinson Ventura Hall Stanford University		Co-director	
Lee J. Cronbach Center for Advanced Study in the Behavioral Sciences Stanford, California		Co-director	
	Doctoral study, Year of degree	1963-64 Position	1964-65 Position
Group A – John B. Carroll, Graduate School of Education, Harvard University Ellis B. Page, Bureau of Educational Research, University of Connecticut			
Cahen, Leonard	Stanford, - - -	Project Coordinator, National Longitudinal Study of Mathematical Abilities, Stanford	same
Hall, Alfred E.	Princeton, 1963	Assistant Professor, Social Studies Project Evaluator, Carnegie Inst. of Technology	same
Hansen, Duncan N.	Stanford, 1964	Research Associate, Institute for Mathematical Studies in the Social Sciences, Stanford	same

	Doctoral study, Year of degree	1963-64 Position	1964-65 Position
Hudgins, Bryce B.	Washington University, 1958	Associate Professor of Education, Washington Univ.	same
McHale, Thomas J.	Illinois, 1964	Research Assistant, Training Research Lab., University of Illinois	Assistant Professor of Psychology, Gonzaga Univ., Spokane
Millman, Jason	Michigan, 1960	Assistant Professor of Education, Cornell	same
Prentice, Joan L.	Indiana, 1964	Grad. Student, Univ. of Indiana	Postdoctoral Fellow, Institute of Human Learning, U.C., Berkeley
Saul, Ezra	Ohio State, 1951	Associate Professor of Psychology, and Director, Institute for Psychological Research, Tufts	same
Sjogren, Douglas D.	Nebraska, 1961	Assistant Professor of Education, Nebraska	same
Stake, Robert	Princeton, 1958	Associate Director, Office of Educational Testing, University of Illinois	same
Temp, George E.	UCLA, 1963	Assistant Professor of Education, University of California, Santa Barbara	same

	Doctoral study, Year of degree	1963-64 Position	1964-65 Position
Turner, M. L.	University of Melbourne --	Chief Research Officer, Australian Council for Educational Research	Doctoral student at Berkeley, School of Education
Group B – L. M. Stolurow, Department of Psychology, University of Illinois Richard C. Anderson, College of Education, University of Illinois			
Biederman, Irving	Michigan, - - -	Teaching Fellow, Univ. of Michigan	same
Easley, John A., Jr.	Harvard, 1955	Research Coordinator, UICSM Mathematics Project Univ. of Illinois	same
Johnson, Paul	Johns Hopkins, 1964	Research Assistant, Johns Hopkins	Asst Prof of Educational Psy., Univ. of Minnesota
Kersh, Bert Y.	Univ. of Calif., Berkeley, 1955	Assoc. Director, Teaching Research, Oregon State System of Higher Education	same
Murphy, George	Univ. of Connecticut, - - -	School Psychologist, Litchfield, Conn.	same
Payne, Donald T.	Indiana, - - -	Research Associate, Audio-Visual Center, Indiana University	same
Scandura, Joseph M.	Syracuse Univ., 1962	Asst. Prof. of Educ., State Univ. of New York at Buffalo	Asst Prof. School of Education, Florida State

	Doctoral study, Year of degree	1963-64 Position	1964-65 Position
Williams, Joanna	Yale, 1961	Asst. Prof. of Educ., Univ. of Pennsylvania	same
Wittrock, M. C.	Illinois, 1960	Asst. Prof. of Educ., Univ. of Calif., Los Angeles	Associate Prof. of Educ., UCLA
Zinn, Karl	Michigan, - - -	Research Assoc., Center for Research on Learning and Teaching, Univ. of Michigan	same

Group C – Fred L. Strodtbeck, Department of Sociology, University of Chicago
Louis M. Smith, Graduate Institute of Education, Washington University

Eagle, Norman	Rutgers, 1963	School Psychologist, Fort Lee Intermediate School, New Jersey	same
Foster, Gordon	Ohio State, - - -	Instructor, Miami Univ.	same
Garfunkel, Frank	Boston Univ., 1962	Assoc. Prof. of Educ., Boston Univ.	same
Glick, Oren W.	Univ. of Kansas, 1963	Director of Evaluation, Youth Development Project, Kansas City	same
Gordon, Edmund W.	Columbia, 1957	Professor of Education Yeshiva Univ.	same
Hutchins, Edwin B.	Illinois, 1958	Asst. Dir of Basic Research, Assoc. of American Medical Colleges, Evanston	same

	Doctoral study, Year of degree	1963-64 Position	1964-65 Position
Smith, Charles P.	Michigan, 1961	Asst. Prof. of Psychology, Princeton	same
Trask, Anne E.	Harvard, 1962	Asst. Prof. of Educ., Illinois	same
Warren, Jonathan R.	Univ. of Calif., Berkeley, 1959	Director of Counseling and Research, College Student Personnel Institute, Pasadena	same
White, Meda	Univ. of Chicago, 1964	Univ. of Texas	Research Assoc., Univ. of Chicago
Group D – J. W. Atkinson, Department of Psychology, University of Michigan Robert Moulton, School of Education, University of California, Berkeley			
Fitzgerald, Donald	Illinois, 1962	Asst. Prof. of Education, Hawaii	Senior Lecturer in Educational Research, Univ. of Melbourne, Australia
Harootunian, Berj	Pennsylvania, 1959	Assoc. Prof. of Educ., Delaware	same
Hartman, Frank	Penn. State, 1957	Assoc. Prof. of Psych. Dickinson College	same
Johnson, Guy J.	Univ. of Texas, ---	USPHS Fellow, Texas	same
McCullers, John C.	Univ. of Texas, 1961	Asst. Prof. of Psych. San Jose State	same

	Doctoral study, Year of degree	1963-64 Position	1964-65 Position
Singer, Robert D.	Pennsylvania, 1960	Assoc. Prof., and Dir. Psychological Services, State Univ. of N.Y. at Stony Brook	same
Taylor, Marvin	Syracuse, 1955	Asst. Prof. of Educ., Queens College, N.Y.	same
Wolf, Willavene	State Univ. of Iowa, 1960	Asst. Prof. of Educ., Ohio State	same